

engines half speed in a severe easterly changing to northwesterly gale.

The most violent storm of the month was central south of the Aleutian Islands on the 23d and 24th. The American steamships *Dilworth* and *Las Vegas* encountered westerly gales of force 10 in 45° N., 166° to 170° E., lowest pressure about 29.10 inches, on the 23d. On the following day the cyclone intensified and the *Las Vegas* at local noon was in a west-northwesterly gale, force 11, accompanied by rain and snow, in 45° 20' N., 170° 30' E. Earlier on the 24th the Canadian S. S. *City of Vancouver* was nearer the center of the disturbance, eastward bound in a whole west gale, lowest pressure 28.73 inches, in 45° 44' N., 174° 46' E. This storm by the 25th had merged with the Aleutian Low and lost greatly in intensity.

No gales were reported from Mexican and Central American coast waters. Calms and light variable winds were frequent, but gentle northwesterly winds prevailed over most of the area.

CYCLONIC DISTURBANCES IN THE NORTH INDIAN OCEAN

By ALBERT J. MCCURDY, JR.

Weather reports received from vessels that traversed the shipping routes of this ocean in May, 1924, indicate

551.506 (73)

DETAILS OF THE WEATHER IN THE UNITED STATES

GENERAL CONDITIONS

ALFRED J. HENRY

The outstanding feature of the month was the depression in temperature in north-central and northeastern districts and the attendant cloudy, rainy weather which greatly retarded farming operations as noted elsewhere. The temperature distribution—low in the east and high in Pacific coast States—again illustrates the great contrasts that are occasionally experienced on opposite sides of the Rocky Mountains. The usual details follow.

CYCLONES AND ANTICYCLONES

By W. P. DAY

High-pressure areas during May were largely of the Alberta type, some of them moving south-southeast along the eastern slope of the Rockies in a manner not unlike the movement observed in these highs during the colder season.

Pressure was low over middle latitudes east of the Mississippi River from the 6th to the 14th, with several secondary disturbances developing within this area. The most important storms coming out of this area developed considerable intensity on the middle Atlantic coast on the 7th-8th and again on the 11th and 12th.

FREE-AIR SUMMARY

By V. E. JAKL, Meteorologist

The mean free-air temperature for the month was below normal over all aerological stations, the deficiency being much more pronounced over the northern stations than in the South. (See Table 1.) The departure was greatest over Ellendale, where the temperature averaged more than 4° C. below normal to the upper limit of observation, and least over Due West, where it was only a fraction of a degree colder than normal. This is substan-

tially in agreement with Chart III this REVIEW, which shows, for the region east of the Rocky Mountains, negative departures diminishing in general from north to south. The departures were generally quite uniform with altitude, indicating a similarity in source of supply of air at the different altitudes included in the observations. An exception is noted at Royal Center, where the departure increased decidedly with altitude.

The source of supply of air for the different altitudes at each station is well shown in the record of wind resultants for the month determined from kite observations (Table 2), and from the auxiliary record of pilot balloon observations, the resultants from the two classes of observations being in close agreement. There was a definite positive correlation between wind direction and temperature at all levels over Ellendale, Drexel, and Broken Arrow, where a subnormal temperature was associated with winds having a decidedly more northerly trend than usual for the month. Royal Center, to the east of these stations, showed resultant winds that were approximately normal in direction but abnormal in strength. At this station a marked deficiency in temperature occurred in connection with westerly winds that had a slight northerly component in the upper levels and a rather decided southerly component in the lower levels. It is apparent that in the upper levels over Royal Center the air was transported from regions to westward, where abnormally cold northerly winds prevailed. Moreover, the free-air records on the whole indicate what is suggested by the surface observations, viz, a general circulation of the air to at least a few thousand meters depth, from northwestern to eastern sections, in conformity with the average surface pressure gradient. (See Chart VI.) Over Groesbeck and Due West, where the temperature departures were slight, the wind resultants showed no important deviation from normal.

Relative humidities were on the whole somewhat below normal, which, coupled with the lower temperatures that prevailed, indicated a low water content of

that stormy conditions prevailed off the southern coast of India and in the vicinity of Ceylon and the Maldiv Islands in the middle decade of the month.

The Dutch S. S. *Yseldijk*, Capt. C. de Korver, proceeding from Rotterdam to Australia, on May 13, encountered a moderate southeasterly gale accompanied by squally weather and rain showers. Mr. D. Treep, observer, states that the lowest pressure observed was 30.03 inches (uncorrected), occurring at 6.03 p. m., in 16° 10' N., 89° 03' E. This gale lasted for two days and during that time the wind shifted from SE. to ESE.

On the 15th the American S. S. *West Mahomet*, Capt. H. Milde, Suez bound from Calcutta, ran into a moderate southwesterly gale accompanied by rough seas and overcast skies. Mr. Paul P. Zabeline, observer, reports that the lowest pressure observed was 29.70 inches, occurring at 6 p. m., in 9° 10' N., 83° E. The wind at this time was SSW., force 7.

The *West Mahomet* encountered its second gale of the month northwest of the Maldiv Islands on the 19th, reporting conditions similar to those experienced in the previous storm. The observer reports that at 5 p. m., while in 8° 20' N., 70° 30' E., the lowest pressure was recorded, being 29.75 inches. The wind at this time was W., force 7, and by 8 p. m., increased to a fresh gale.